

ABSTRACT

Disclosed herein are a method for generating hydrogen gas, an apparatus for producing hydrogen gas, and an energy conversion system, which are so designed as to generate hydrogen extremely efficiently without the help of catalyst.

The hydrogen gas is generated by decomposing a metal hydride represented by the formula (1) below in a mixture composed of said metal hydride, water, and a second solution which has a pH value lower than that of the aqueous solution of said metal hydride.

Formula (1) : $\alpha_{z(1-x)}\beta_{zx}[\text{BH}_y]$

(where α and β are mutually different elements selected from Groups 1A, 2A, and 2B of the periodic table; and x , y , and z are defined respectively by $0 \leq x \leq 1$, $3 < y < 6$, and $0 < z < 3$.)

The hydrogen gas generating apparatus is composed of a first reservoir to store the aqueous solution of the metal hydride, a second reservoir to store a second solution which has a pH value lower than that of said aqueous solution, and a reactor to mix together said aqueous solution and said second solution, thereby generating hydrogen gas. The thus evolved hydrogen gas is converted into electrochemical energy by the energy conversion apparatus.